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RESEARCH ARTICLE

New data on diagnostics and distribution of the little-known comb-clawed beetle *Cornucistela serrata* (Coleoptera: Tenebrionidae: Alleculinae)

Новые данные по диагностике и распространению малоизвестного жукапыльцееда *Cornucistela serrata* (Coleoptera: Tenebrionidae: Alleculinae)

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Abstract. Additional diagnostic characters of the little-known alleculine species *Cornucistela serrata* Campbell, 1980 are discussed. Variability of ocular index, a character widely used in the systematics of Alleculinae, is demonstrated. The distribution of *C. serrata* is amended; the species is known from the central part of Saudi Arabia and not from western provinces of the country as previously thought. A corrected key to species of *Cornucistela* Campbell, 1980 is given.

Резюме. Обсуждаются дополнительные диагностические признаки малоизвестного жукапыльцееда *Cornucistela serrata* Campbell, 1980. Продемонстрирована изменчивость окулярного индекса, широко используемого в систематике Alleculinae. Уточнено распространение *C. serrata*: вид известен из центральной части Саудовской Аравии, а не из западных провинций страны, как считалось ранее. Для видов рода *Cornucistela* Campbell, 1980 дана определительная таблица с исправлениями.

Key words: morphology, variability, ocular index, Saudi Arabia, Tenebrionidae, Alleculinae, Gonoderina, *Cornucistela*

Ключевые слова: морфология, изменчивость, окулярный индекс, Саудовская Аравия, Tenebrionidae, Alleculinae, Gonoderina, *Cornucistela*

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Introduction

The genus *Cornucistela* Campbell, 1980 comprises two species locally distributed in the west of Saudi Arabia and the east of Iran. The genus was erected as monotypic (Campbell, 1980), based on three males and one female of the type species *Cornucistela serrata* Campbell, 1980 from Saudi Arabia. Later, an additional species *C. anichtchenkoi* Novák et Nabozhenko, 2019 was described from the South Khorasan Province of Iran (Novák & Nabozhenko, 2019). Campbell (1980) has included this genus in the tribe Gonoderini, which is now interpreted as the subtribe Gonoderina within the tribe Alleculini (Bousquet et al., 2015).

Recently we have found the first additional specimen (male) of *Cornucistela* in the collection of the Natural History Museum (London), which has distinct differences from *C. serrata*, but in our opinion belongs to this species. Below we discuss the variability and diagnostic characters of this little-known desert comb-clawed beetle.

Material and methods

The specimen was examined by relaxing in warm water, dissecting the abdomen and its inner contents. The specimen including its dissected parts was mounted on a pinned card. Photographs were taken with a Canon DSLR camera, Laowa 25 mm and 60 mm macro lenses. All photographs were processed through focus stacking software Helicon Focus and were later edited using GNU Image Manipulation Program.

We used the ocular index (distance between eyes / distance across eyes × 100) according to the work by Campbell & Marshall (1964).

Abbreviations in the text: l, length to width ratio for longitudinal antennomeres; t, width to length ratio for transverse antennomeres.

The beginning and end of label text are indicated using double quotes (“ ”); a double slash (//) separates the data on different labels.

The examined specimen is deposited at the Natural History Museum, London, the United Kingdom (NHM).

Results

Order **Coleoptera**

Family **Tenebrionidae**

Subfamily **Alleculinae**

Tribe **Alleculini**

Subtribe **Gonoderina**

Genus ***Cornucistela*** Campbell, 1980

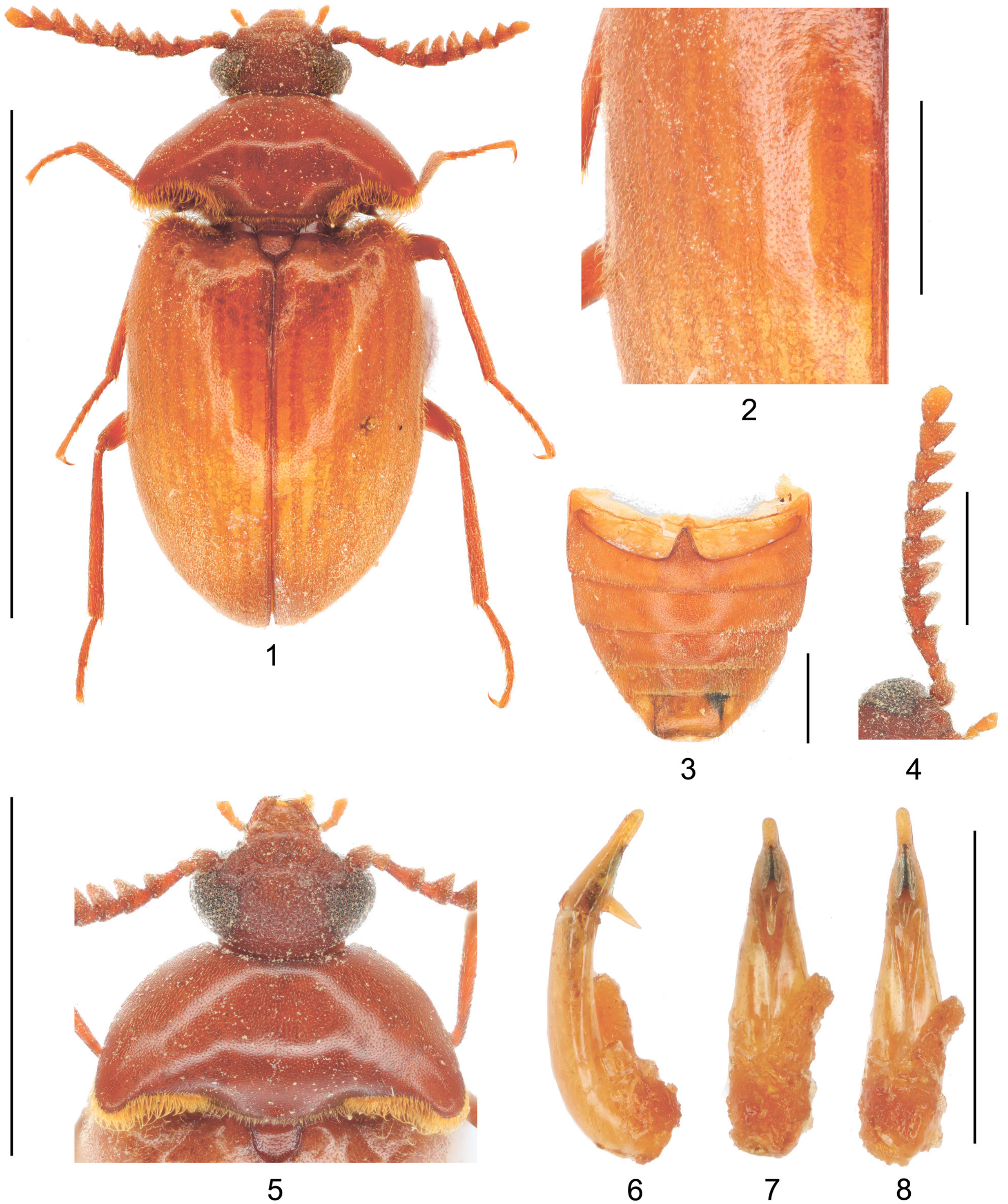
Cornucistela serrata Campbell, 1980
(Figs 1–8)

Material examined. **Saudi Arabia**: “Arabia: S. Hedjax [Hejaz], Qui’iya. 14.viii.1931. H. St. J. B. Philby. B.M.1931-549 // NHMUK014381294”, 1 male (NHM).

Note. We found only two localities with similar names in Saudi Arabia: Qai’iya (=Al-Qai’yah; 24°19′N 43°31′E) and Quai’iya (=Al Quway’iyah; 24°03′N 45°15′E). Both villages are located in the Riyadh Province of Saudi Arabia, and not in the south of the historical region Hejaz, where the specimen was ostensibly collected. Hejaz includes six current provinces in the west of Saudi Arabia. We found that Philby travelled near Taif and As-Shafa in Southern Hejaz and from Mecca to Riyadh during August–October 1931, according to the inventory of the Philby archive (“collection”) available online (Harry St John Philby collection, 2004). However, localities with the name “Qui’iya” or similar are absent in the Hejaz region (at least we did not find it on available maps of the 20th century and modern maps). The second of two localities listed above, village Quai’iya (=Al Quway’iyah; 24°03′N 45°15′E), is situated on the road between the latter two cities and two regions, Hejaz and Riyadh. We assume that the specimen was collected there.

Diagnostic characters of the specimen. Body rufo-testaceous, pronotum and head slightly darker than elytra. Ocular index 48. Ratios of length : width of antennomeres 1–11: 1.5 : 1.5, 1.2 : 1.1 (l = 1.09), 2.5 : 1.9 (l = 1.32), 2.1 : 2.5 (t = 1.19), 1.7 : 2.7 (t = 1.58), 1.9 : 2.8 (t = 1.64), 1.7 : 2.8 (t = 1.64), 1.8 : 2.8 (t = 1.55), 2.0 : 2.5 (t = 1.25), 1.9 : 2.4 (t = 1.26), 2.5 : 2.0 (l = 1.25). Basal margin of pronotum straight in middle, fully pubescent with moderately long dense setae. Elytra covered with clear dense recumbent pubescence; setae longer and suberect on lateral sides and apical parts of elytra.

Distribution. The species is distributed in central Saudi Arabia. The locality in western Saudi Arabia (Hejaz region) on the map shown by Novák & Nabozhenko (2019) is erroneous. Here we use for our map (Fig. 9) the following localities and coordinates published for the expedition of Prof. Wilhelm Büttiker, who collected the type series of *C. serrata* in Saudi Arabia in 1977–1978 (Sabatinelli & Pontuale, 1998): Wadi Khumra (24°57′N 46°06′E; type locality), Heith, 40 km S of Riyadh (24°29′N 47°00′E), and Kushm al-Buwaybiyat (25°12′N 46°50′E).



Figs 1–8. *Cornucistela serrata*, male from Quai'iya. **1**, habitus, dorsally; **2**, pubescence of elytra; **3**, abdominal ventrites; **4**, left antennomere; **5**, head and pronotum; **6**–**8**, aedeagus (6, laterally; 7, ventrally; 8, ventrally, turned forward, with apical part in normal position). Scale bars: 5 mm (1), 1 mm (2–4, 6–8), 2 mm (5).

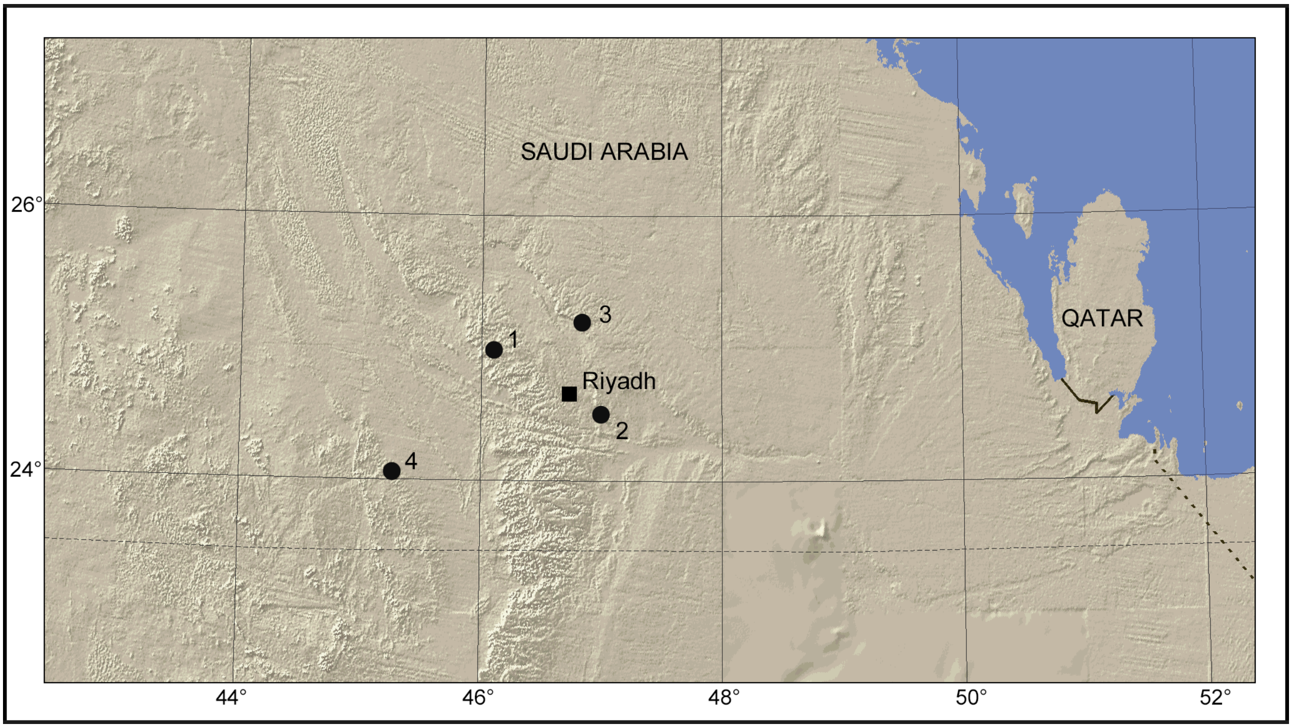


Fig. 9. *Cornucistela serrata*, distribution. **1**, Wadi Khumra (holotype); **2**, Heith (paratypes); **3**, Kushm al-Buwaybiyat (paratypes); **4**, Quai'iya (specimen collected by Philby).

Discussion

Campbell (1980) indicated in the original description that all males (holotype and two paratypes) of *C. serrata* have dorsal ocular index of 44, while in our specimen the ocular index is 48. This index is widely used in the systematics of Alleculinae, especially to distinguish species within a genus (Campbell & Marshall, 1964). It is assumed that the index value is the same for all populations of a species, making it possible to clearly distinguish different species. However, there are no specific studies to support this assumption.

Our examined specimen differs from the holotype and paratypes according to the original description and from the previously examined paratype from the Canadian National Collection (CNC; Ottawa, Canada) (Novák & Nabozhenko, 2019) not only in the different dorsal ocular index in the male, but also in the structure of the male antennomeres. Campbell (1980) stated that antennomere 4 has a length subequal to width. The male from Qui'iya has a distinctly transverse antennomere 4 and much denser elytral pubescence of slightly longer setae. Despite clear differences, we believe that our specimen also belongs to *C. serrata*, because the male aedeagi are identical and this male was collected close to other known localities (124 km from the type locality) (Fig. 9). The paratype deposited at CNC is probably female, and not male as indicated in the original description, because it has an ocular index near 52, as in females.

We propose the following key to species of the genus *Cornucistela* taking into account the variability mentioned above:

1. Dorsal ocular index of male 44–48. Antennomere 4 transverse or of subequal length and width. Elytra wider and shorter, 1.34 times as long as wide. Surface of elytra (excluding base) covered with very short or moderately short recumbent setae .... ***C. serrata***

– Dorsal ocular index of male about 40. Antennomere 4 longitudinal. Elytra elongate, 1.65 times as long as wide. Surface of elytra (excluding base) covered with very short erect setae .... ***C. anichtchenkoi***

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